

REMARKS

This Amendment and Response is submitted in reply to the Office Action mailed August 14, 2003. Claims 1-66 were pending. Reexamination and reconsideration is respectfully requested.

Claim 55 was rejected under 35 U.S.C. §112(2) as being indefinite. Appropriate antecedent has been added.

Claims 1-8, 11-13, 24-25, 28-29, 35, 48, 51-54, 60-61 and 64-66 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,286,553 (Haraguchi) in view of U.S. Patent No. 4,983,453 (Beall).

The claimed invention is directed to a pultruded part with a reinforcing structure in which a portion of the reinforcing fibers are oriented transversely to the longitudinal reinforcing fibers or rovings. Pultrusion is a continuous, dynamic process in which longitudinal rovings and resin are pulled through a forming dye. In most applications, the resulting part has a uniform cross-section similar to an extruded part. The dynamic nature of the pultrusion process makes it extremely difficult to orient reinforcing fibers transverse to the longitudinal rovings. The reinforcing fibers are held together by a transport web of staple fibers. It is the combination of the longitudinal rovings, the transversely oriented reinforcing fibers, and the permeable transport web that give the claimed pultruded part its strength.

Haraguchi is directed to a reinforcing material for a molded article. (Haraguchi, column 2, line 2; column 2, line 10; column 3, lines 27-30; and column 4, lines 26-33). With respect to the reinforcing material, molding is a substantially static process. The reinforcing structure is located in a mold and resin is then injected into the mold, typically encapsulating the reinforcing material. Haraguchi contains no teaching or disclosure that his reinforcing material was suitable for use in a pultruded article. In fact, Haraguchi makes no mention of pultrusion whatsoever.

As acknowledged on page 4 of the Office Action, Haraguchi "fails to teach a pultruded part that also comprises a plurality of longitudinal rovings oriented along the

longitudinal axis and a resin matrix surrounding the longitudinal rovings and the reinforcing structure.” The reinforcing structure of Haraguchi is “a web in which bundles of reinforcing filaments are gathered and uni-directionally paralleled, a woven sheet such as a plain weave or satin weave sheet, and a knitted sheet.” (Haraguchi, column 4, lines 22-26).

Beall teaches the use of a cellulosic mat to reduce the density and cost of a pultruded product. The cellulosic mat of Beall “also enables the production of products having relatively lower percentages of glass than can now be made with good uniformity.” (Beall, column 4, lines 59-62). In particular, Beall recognizes that pultruded products in the range of 3 mm thick must be substantially over-designed in glass fiber compound because it is not practical to pultrude through thinner dyes. However, if the glass fiber content is reduced, resin-rich areas may form which have poor physical properties and may cause jamming of the dye. The addition of the low-density cellulosic mat is disclosed as maintaining composition and integrity, and providing a means for reducing the fiberglass content, while overcoming the before-mentioned limitations. (Beall, column 4, line 63 through column 5, line 4). In essence, Beall teaches that the use of the cellulosic mat permits reduced glass fibers content in the pultruded part.

It is asserted on page 5 of the Office Action that the Beall reference is used to “show that the use of longitudinal rovings and a resin matrix in combination with a reinforcing mat is well known in the art.” Even assuming this proposition is true, it is an insufficient basis for rejecting the pending claims.

First, not all reinforcing mats are the same. Some reinforcing structures are suitable for pultruded parts, and some can not. Applicants submit that the cited references do not support the proposition that the proposed reinforcing mat constructed from the combination of Haraguchi and Beall is suitable for pultruded parts. The present invention claims a specific reinforcing mat structure suitable for use in pultruded parts and patentable weight must be given to those limitations of the claims.

Second, for the rejection to succeed, some teaching or disclosure must be found in the primary reference, Haraguchi, for the proposed modification. See *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991). As is discussed above, Haraguchi is devoted exclusively to molded articles. Haraguchi is

completely devoid of any suggestion that the disclosed reinforcing material is suitable for use in a pultruded article. Even if the reinforcing material of Haraguchi, as modified by Beall, is suitable for use in pultruded products (a proposition for which there is not support in the reference), there is absolutely no teaching or suggestion in Haraguchi that the uni-directional bundles of filaments would be oriented in the transverse direction relative to the (non-existent) rovings, as recited in the independent claims of the present application.

On the other hand, if Beall is the primary reference, the rejection also fails. Beall specifically teaches the use of a cellulosic mat to reduce the glass content in the resulting pultruded part. Adding the claimed reinforcing fibers transverse to the longitudinal rovings is inapposite to the stated purpose in Beall. Consequently, Beall teaches away from the combination of Beall in view of Haraguchi.

For the reasons discussed above, Applicants respectfully submit that the rejection of Haraguchi in view of Beall be withdrawn.

Claims 22-23, 26-27 and 56-60 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Haraguchi and Beall. For the reasons discussed above, Applicants submit that the rejected claims are patentable over the cited references. With regard to the definiteness of the rejected claims, Applicants respectfully submit it is impermissible to ignore the advantages, properties, utilities, and unexpected results flowing from the claimed invention since they are part of the invention as a whole. In re Chupp, 816 F.2d 643, 2 USPQ2d 1437 (Fed. Cir. 1987). The physical properties of the claimed structures are affirmative limitations that must be given patentable weight when reviewing patentability.

Claims 9-10 and 55 were rejected under 35 U.S.C. § 103 as being unpatentable over Haraguchi in view of U.S. 6,080,482 (Martin). As discussed above, Haraguchi is directed to a reinforcing material for molded parts. There is no teaching or disclosure in Haraguchi for making pultruded parts, or whether the reinforcing material is suitable for use in a pultruded article. Additionally, Haraguchi lacks any teaching or disclosure for orienting the bundles of uni-directional filaments transversely to the longitudinal rovings in a pultruded part. Martin is equally silent on the use of its filaments in a pultrusion process. Consequently, there is no teaching or suggestion for the proposed modification of Haraguchi in view of Martin. Applicants submit that no prima-facie case of obviousness is set forth.

Claims 16 and 17 were rejected under 35 U.S.C. § 103 as being unpatentable over Haraguchi in view of U.S. 4,278,720 (Shannon). For the reasons discussed in connection with claim 1, Applicants respectfully submit that Haraguchi is insufficient to establish a prima-facia case of obviousness and that the required teaching or suggestion for the proposed modification is lacking. Consequently, Applicants respectfully submit that claims 16 and 17 distinguish over the cited references.

Claims 14-15, 32-34, 36-47 and 62-63 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Haraguchi in view of U.S. 5,055,242 (Vane). Vane discloses a reinforcing material having a plurality of superimposed layers of unidirectional non-woven yarns or threads laid side-by-side. The yarns in at least some of the different layers extend in different directions. The layers of reinforcing material are stitched together by knitting so as to secure the yarns in fixed positions relative to one another.

Claim 1 does not recite stitching. In light of the allowability of claim 1 as discussed above, Applicants submit that claims 14-15, 32-34, 36-47 distinguish over the cited references. Secondly, there is no teaching or disclosure in Haraguchi for the proposed modification. In fact, Haraguchi teaches away from woven structures:

“It is considered that the reason why the UD [unidirectionally paralleled] web is superior to the woven sheet is probably as follows.

In the woven sheet, yarns bend at crossing points of warps and wefts, and since reinforcing filament bundles are tightened by these bends, when the woven sheet is formed into a composite, reinforcing filaments are not uniformly dispersed in the composite and concentration of the stress occurs, and thus, the mechanical properties become poor. Moreover, since the boundary between the warps and wefts is definite, when the woven sheet is formed into a composite, thermoplastic polymer-rich portions extending in the direction of the reinforcing filaments are formed, and the strength is low in the direction orthogonal to the reinforcing filaments in the composite.” (Haraguchi, col. 4, lines 43-56)(Emphasis added).

Applicants respectfully submit that woven sheets are analogous to stitched sheets and that the problems identified in Haraguchi apply to both.

Independent claims 62 and 63 both recite staple fibers attached to the first and second reinforcing fibers. Claims 62 and 63 do not rely on stitching to secure the first and second reinforcing fibers. Therefore, Applicants submit that no prima facie case of obviousness is set forth.

Claims 18-22 and 30-31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haraguchi in view of Beer et al. (U.S. 5,910,458). Applicants respectfully submit that in light of the allowability of claim 1 is discussed above, claims 18-23 and 30-31 distinguish over the cited references.

Again, for the rejection to succeed, some teaching or disclosure must be found in the primary reference, Haraguchi, for the proposed modification. The needling of Beer can damage, and frequently cuts, the reinforcing fiber. Needling would also likely break up the bundles of uni-directional filaments so prized by Haraguchi. Applicants respectfully submit that Haraguchi teaches away from using the needling of Beer and that there is no motivation for their proposed modification of Haraguchi with Beer. Applicants submit that claims 18-22 and 30-31 distinguish over the cited references and are in condition for allowance.

Claims 49-50 were rejected under 35 U.S.C. §103(a) as being unpatentable over Haraguchi and Beall and further in view of Heikkila et al. (U.S. 5,585,155). In light of the allowability of claim 1 as discussed above, Applicants respectfully submit that claims 49 and 50 distinguish over the cited references and are in condition for allowance.


Claims 1-47 and 55-56 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-76 of co-pending Application No. 10/015,106 in view of Beall. It is respectfully submitted that co-pending Application No. 10/015,106 is commonly assigned to Pella Corporation and was filed on the same day herewith. Consequently, Application No. 10/015,106 is not prior art to the present application. Applicants respectfully request the rejection based on double patenting be withdrawn.

Conclusion

All pending claims are now in condition for allowance. A notice to that effect is respectfully requested.

Respectfully Submitted,

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